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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,954	04/12/2004	Evelyn Boettcher	082134-0308872	2383
909	7590	05/17/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			CALEY, MICHAEL H	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2871	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/821,954

Applicant(s)

BOETTCHER ET AL.

Examiner

Michael H. Caley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-17 and 24-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-17 and 24-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claims 26, and 31 objected to because of the following informalities:

Regarding claim 26, line 2, “complaint” should read as --compliant--

Regarding claim 31, line 1, “comprising steps of” should read as --comprising-- since the claim is directed to a product.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 13-17, 25, 26, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Fernald et al. (U.S. Patent No. 6,229,827 “Fernald”).**

Regarding claim 13, Fernald discloses a method of filtering an optical signal comprising the steps of:

coupling an optical signal having a plurality of wavelengths (Figure 1 element 14;

Column 4 lines 17-22) into an optical fiber (Figure 1 element 10); and

selectively filtering at least one wavelength out of the plurality of wavelengths by varying a load applied to a compliant support block (Figure 1 element 20) having at least a first portion of the optical fiber embedded therein (Column 4 lines 23-54),

wherein the first portion of the optical fiber has a periodic variation in refractive index along at least a portion thereof to form a fiber Bragg grating in the fiber (Column 3 lines 54-63).

Regarding claim 14, Fernald discloses varying the load applied to the compliant support block as changing a transmission characteristic of the fiber Bragg grating (Column 4 lines 23-54).

Regarding claim 15, Fernald discloses the compliant support block as having a substantially cylindrical shape, and wherein the varying the load applied to the compliant support block comprises changing a compressional force applied between opposing ends of the compliant support block (Column 4 lines 23-54).

Regarding claim 16, Fernald discloses the filtered optical signal as reflected from the fiber Bragg grating (Column 4 lines 17-22).

Regarding claim 17, Fernald discloses the filtered optical signal as transmitted through the fiber Bragg grating (Column 4 lines 17-22).

Regarding claim 25, Fernald discloses the step of varying a load as causing an axial strain and a compressive strain on the optical fiber (Column 1 line 57 – Column 2 line 13).

Regarding claim 26, Fernald discloses the step of varying a load as including pressing a rigid surface against the compliant support block, and wherein an amount of the axial strain is dependent upon an orientation of the optical fiber with respect to the rigid surface (Figure 1 elements 20, 56, and 64; Column 3 lines 23-54)

Regarding claim 30, Fernald discloses the apparatus for achieving the method of filtering the optical signal (Figure 1).

**Claim 24 is rejected under 35 U.S.C. 102(e) as being anticipated by Fernald in light of Hay et al. (U.S. Patent No. 6,278,811 “Hay”).**

Regarding claim 24, Fernald fails to explicitly disclose the step of varying a load as causing deformation of the compliant support block, such that a radial component of the compliant support block increases and decreases with respective increases and decreases of the load. Fernald, however, discloses an apparatus in which the compliant support block inherently experiences deformation as proposed. Hay, for example, discloses a compliant support block of the same material as used by Fernald as experiencing such deformation (Column 4 line 55 – Column 5 line 14, Column 6 lines 44-46). The pressure exerted at longitudinal ends of the support block as disclosed by Fernald (Figure 1) thus implies a radial component of the

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compliant support block as increasing and decreasing responsive to increases and decreases of the load due to its deformable nature.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fernald in view of Pan et al. (U.S. Patent No. 6,240,220 "Pan").**

Fernald discloses all of the proposed limitations except for a relationship between a length of the at least one selectively reflected wavelength and the length of the rigid surface displacement as substantially linear. Pan, however, teaches the variation of the filtered wavelength as proportional (or linearly related) to the change in the length of fiber (Column 4 lines 16-41; Column 5 lines 40-56).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the grating such that the length of the filtered wavelength is linearly related to the displacement of the rigid surface. Pan teaches such a relationship in a tunable grating as advantageous so that the controller may be constructed with a lesser complexity (Column 1 lines 37-65).

**Claims 28, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernald in view of Milhailov et al. (U.S. Patent No. 5,706,375 "Milhailov").**

Regarding claim 28, Fernald discloses all of the proposed limitations except for the steps of passing wavelengths through the first fiber Bragg grating to a second portion of the optical fiber embedded in a second compliant support block, the second portion having a periodic variation in refractive index along at least a portion thereof to form a second fiber grating in the optical fiber, selectively reflecting at least a second wavelength by varying a load applied to the compliant support block, and forming a second optical signal of the first and second wavelengths. Milhailov, however, teaches an arrangement of multiple tunable fiber Bragg gratings in series operable to reflect different wavelengths of a signal along a common fiber to form a composite signal of multiple reflected wavelengths (Column 6 lines 23-51; Figure 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have filtered an optical signal according to the proposed method of having two tunable fiber Bragg gratings in series as proposed and form a second optical signal of the first and second optical wavelengths using the individual compression-tuned Bragg gratings disclosed by Fernald. One would have been motivated to filter an optical signal using such a method as a means of a routing or demultiplexing function capable of attenuating a signal (Milhailov, abstract, column 2 lines 11-24).

Regarding claim 29, Fernald fails to disclose the second optical signal as formed at a third portion of the optical fiber located before the first and second fiber Bragg gratings in a transmitting direction of the other wavelengths passed through the first fiber Bragg grating.

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Milhailov, however, teaches such a portion of fiber between the circulator and the first Bragg grating as a part of an optical routing system (Figure 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a third portion of optical fiber before first and second compression-tuned Bragg gratings such as disclosed by Fernald. One would have been motivated to filter an optical signal using such a method as a means of a routing or demultiplexing function capable of attenuating a signal (Milhailov, abstract, column 2 lines 11-24).

Regarding claim 31, Fernald as modified by Milhailov discloses all of the proposed limitations except for a circulator configured to form a second optical signal of the first and second wavelengths arranged at a third portion of the optical fiber located before the first and second fiber Bragg gratings. Milhailov, however, teaches such a circulator as a part of an optical routing system (Figure 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a circulator before first and second compression-tuned Bragg gratings such as disclosed by Fernald. One would have been motivated to filter an optical signal using such a method as a means of a routing or demultiplexing function capable of attenuating a signal (Milhailov, abstract, column 2 lines 11-24).

### ***Response to Arguments***

Applicant's arguments filed 2/15/05 with respect to claims 13-17 and 24-31 have been considered but are moot in view of the new ground(s) of rejection.



### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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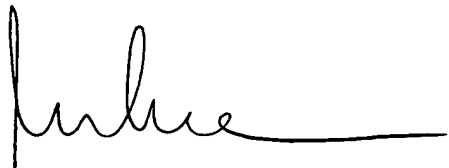
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Michael H. Caley

May 13, 2005



mhc



DUNG T. NGUYEN  
PRIMARY EXAMINER